IN THE CLAIMS:

Listing of Claims

This listing of claims replaces all prior versions, and listings, of claims in the application.

Please cancel claims 24-27, 29-35, and 47 without prejudice to or disclaimer of the subject matter therein. Please add new claims 49-68. No new matter is added by this amendment.

1.-20. (Canceled)

21. (Previously presented) A method, comprising:

creating a dataset that includes a plurality of images associated with a cyclical movement of a body part, at least one image from the plurality of images depicting a non-tissue internal reference marker, being associated with non-tissue internal reference marker positional information, and being at least 2-dimensional;

associating a separate transformation from a tracking space to an image space with each image in the dataset;

calculating for each image in the dataset a dataset vector using a position of an external reference marker and a position of the non-tissue internal reference marker;

outputting data values associated with a display of an image from the plurality of images;

receiving image space coordinates of the non-tissue internal reference marker in the image associated with the dataset vector;

calculating a transformation from the separate transformations using the image space coordinates and the tracking space coordinates;

associating the transformation with the image associated with the dataset vector;

receiving data associated with a current position of the external reference marker;

receiving data associated with a current position of the non-tissue internal reference marker;

calculating a current vector using the data associated with the current position of the external reference marker and the data associated with the current position of the non-tissue internal reference marker;

identifying a match dataset vector (MDV), the MDV being the dataset vector most similar to the current vector, the MDV being associated with an image from the dataset;

receiving a current position of an instrument reference marker coupled to an instrument;

applying the transformation associated with the image associated with the MDV to the current position of the instrument reference marker, thus transforming the current position of the instrument reference marker into image space; and

superimposing a representation of the instrument on the image associated with the MDV.

22. (Previously presented) A method, comprising:

creating a dataset that includes a plurality of images associated with a cyclical movement of a body part, at least one image from the plurality of images depicting a non-tissue internal reference marker, being associated with non-tissue internal reference marker positional information, and being at least 2-dimensional;

associating a separate transformation from a tracking space to an image space with each image in the dataset;

calculating for each image in the dataset a dataset vector using a position of an external reference marker and a position of the non-tissue internal reference marker;

outputting data values associated with a display of an image from the plurality of images;

receiving data associated with a current position of the external reference marker;

receiving data associated with a current position of the non-tissue internal reference marker;

calculating a current vector using the data associated with the current position of the external reference marker and the data associated with the current position of the non-tissue internal reference marker;

identifying a match dataset vector (MDV), the MDV being the dataset vector most similar to the current vector, the MDV being associated with an image from the dataset;

receiving a current position of an instrument reference marker coupled to an instrument;

applying the transformation associated with the image associated with the MDV to the current position of the instrument reference marker, thus transforming the current position of the instrument reference marker into image space; and

superimposing a representation of the instrument on the image associated with the MDV, before outputting data values associated with the display.

23.-44. (Canceled)

45. (Previously presented) A processor-readable medium storing code representing instructions to cause a processor to perform a process, the code comprising code to:

create a dataset that includes a plurality of images associated with a cyclical movement of a body part, at least one image from the plurality of images depicting a non-tissue internal reference marker, being associated with non-tissue internal reference marker positional information, and being at least 2-dimensional;

associate a separate transformation from a tracking space to an image space with each image in the dataset;

calculate for each image in the dataset a dataset vector using a position of an external reference marker and a position of the non-tissue internal reference marker;

output data values associated with a display of an image from the plurality of images;

receive data associated with a current position of the external reference marker;

receive data associated with a current position of the non-tissue internal reference marker;

calculate a current vector using the data associated with the current position of the external reference marker and the data associated with the current position of the non-tissue internal reference marker;

identify a match dataset vector (MDV), the MDV being the dataset vector most similar to the current vector, the MDV being associated with an image from the dataset;

receive a current position of an instrument reference marker coupled to an instrument;

apply the transformation associated with the image associated with the MDV to the current position of the instrument reference marker, thus transforming the current position of the instrument reference marker into image space; and

superimposing a representation of the instrument on the image associated with the MDV.

46. (Previously presented) A processor-readable medium storing code representing instructions to cause a processor to perform a process, the code comprising code to:

create a dataset that includes a plurality of images associated with a cyclical movement of a body part, at least one image from the plurality of images depicting a non-tissue internal reference marker, being associated with non-tissue internal reference marker positional information, and being at least 2-dimensional;

associate a separate transformation from a tracking space to an image space with each image in the dataset;

calculate for each image in the dataset a dataset vector using a position of an external reference marker and a position of the non-tissue internal reference marker;

output data values associated with a display of an image from the plurality of images;

receive data associated with a current position of the external reference marker;

receive data associated with a current position of the non-tissue internal reference marker;

calculate a current vector using the data associated with the current position of the external reference marker and the data associated with the current position of the non-tissue internal reference marker;

identify a match dataset vector (MDV), the MDV being the dataset vector most similar to the current vector, the MDV being associated with an image from the dataset;

receive a current position of an instrument reference marker coupled to an instrument;

apply the transformation associated with the image associated with the MDV to the current position of the instrument reference marker, thus transforming the current position of the instrument reference marker into image space; and

superimpose a representation of the instrument on the image associated with the MDV, before outputting data values associated with the display.

47.-48. (Canceled)

49. (New) The method of claim 21, wherein the plurality of images includes images taken using fluoroscopy.

50. (New) The method of claim 21, wherein the plurality of images includes images taken using computed tomography (CT).

51. (New) The method of claim 21, wherein the plurality of images includes images taken using magnetic resonance imaging (MRI).

52. (New) The method of claim 21, wherein the plurality of images includes 3-dimensional images.

53. (New) The method of claim 21, further comprising before the superimposing, receiving an image signal that includes the image.

54. (New) The method of claim 22, wherein the plurality of images includes images taken using fluoroscopy.

55. (New) The method of claim 22, wherein the plurality of images includes images taken using computed tomography (CT).

56. (New) The method of claim 22, wherein the plurality of images includes images taken using magnetic resonance imaging (MRI).

57. (New) The method of claim 22, wherein the plurality of images includes 3-dimensional images.

58. (New) The method of claim 22, further comprising before the superimposing, receiving an image signal that includes the image.

59. (New) The method of claim 45, wherein the plurality of images includes images taken using   fluoroscopy.

60. (New) The method of claim 45, wherein the plurality of images includes images taken using computed tomography (CT).

61. (New) The method of claim 45, wherein the plurality of images includes images taken using magnetic resonance imaging (MRI).

62. (New) The method of claim 45, wherein the plurality of images includes 3-dimensional images.

63. (New) The method of claim 45, further comprising before the superimposing, receiving an image signal that includes the image.

64. (New)   The method of claim 46, wherein the plurality of images includes images taken using fluoroscopy.

65. (New) The method of claim 46, wherein the plurality of images includes images taken using computed tomography (CT).

66. (New) The method of claim 46, wherein the plurality of images includes images taken using magnetic resonance imaging (MRI).

67. (New)   The method of claim 46, wherein the plurality of images includes 3-dimensional images.

68. (New) The method of claim 46, further comprising before the superimposing, receiving an image signal that includes the image.